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Elementary Review of Electron Microprobe Techniques and Correction Requirements

The chemical composition of a specimen can be determined quantitatively by electron microprobe analysis; however, suitable corrections must be applied to the instrumental data. A report has been prepared which contains these correction requirements in summary and tabulated form for easy reference.

A condensed review of electron microprobe techniques is presented, including background material for obtaining X-ray intensity data corrections. Absorption, atomic number, and fluorescence corrections are also presented. The information is elementary review, prepared for initial or potential users of microprobe equipment.

The chemical composition of a specimen can be determined quantitatively by applying these corrections to the instrumental data. The corrections fall into two categories: instrumental, and those related to the interaction of both electron and X-ray beams with the specimen. Details of these corrections are presented.

The instrumental corrections are: (a) correction for experimental drift, (b) precision of intensity measurement, (c) background determination, and (d) correction of counting rates.

The other corrections are for absorption, atomic number, and secondary fluorescence. These are required because electrons interact with the specimen in the following ways: (a) they are in part backscattered; (b) they produce continuous radiation; (c) they produce heat; and (d) they produce characteristic spectral emission.

Complete details are contained in: *Corrections for X-Ray Intensity Data Obtained from Electron Microprobes*, by Raymond K. Hart, ANL-7078, Argonne National Laboratory, Argonne, Illinois, November 1965. This report is available from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151; price: \$3.00, microfiche: \$0.65.

Note:

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Patent status:

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